

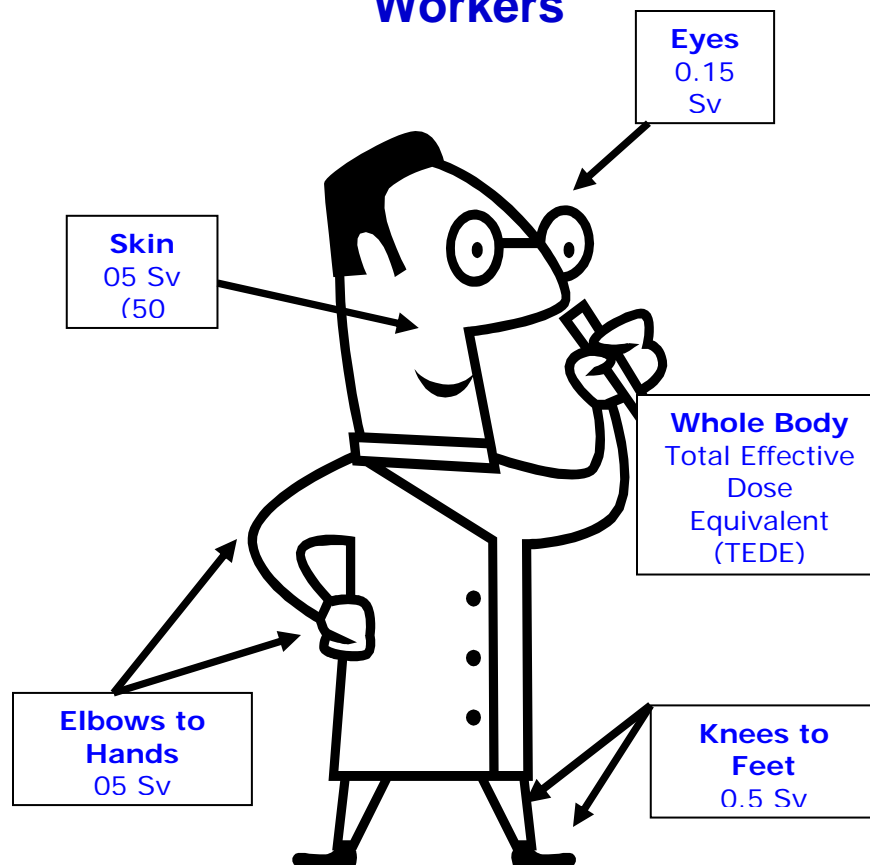
Personnel Monitoring-Who Needs to Wear Personnel Monitoring Devices?

Nevada Regulations ([NAC 459.339](#)) requires that licensees provide personnel dosimetry badges to adults likely to receive, from external sources of radiation-a dose in excess of 10 percent of the applicable limits (see illustration below). Personnel dosimetry is also required for minors and women who have declared their pregnancy who are likely to receive a dose greater than 10 percent of their respective limits.

Some radiation workers may not have to wear personnel monitoring badges because the potential for significant exposures is very low. In these instances, during the licensing process or before discontinuing existing badge service for these radiation workers, licensees must demonstrate through measurement and/or calculation that worker doses are expected to be less than ten percent of the annual occupational dose limits pictured below.

For example: the annual dose limit for the whole body is 5 rem (5,000 millirem). Ten percent of this limit is 500 millirem. Therefore, if the licensee can demonstrate that the radiation worker will not exceed a whole body dose of 500 millirem in one year, the worker is not required to wear a monitoring badge. Instead, the use of a monitoring badge would be considered optional. Even though workers may not be required to wear a personnel monitoring device, the Radiological Health Section recommends that personnel monitoring devices be considered so an accurate record of the worker's radiation exposure is maintained. This may be important if health problems are manifested and the question of radiation exposure as a causative effect is considered.

Annual Dose Limits for Radiation Workers



One way to evaluate the average dose received by each individual radiation worker is to have them wear a monitoring badge for a specific time period (e.g. one year).

The dosimetry reports generated by the badge supplier can then be used to estimate the worker's expected annual radiation exposure under normal conditions.

Records regarding this worker dose evaluation should be well documented and maintained for inspection by the Radiological Health Section.

If considerable changes occur in the licensee's workload for use of radioactive material, the assessment of the radiation worker's average annual dose must be evaluated in order to demonstrate compliance.

Regulations pertaining to monitoring for radiation exposure.

Each licensee or registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the occupational exposure to radiation from licensed and unlicensed radiation sources under the control of the licensee and shall supply and require the use of individual monitoring devices by:

1. Adults likely to receive, in one year from external sources of radiation, a dose in excess of ten percent of the limits in **NAC 459.325** ;
2. Minors likely to receive, in one year from radiation sources external to the body, a deep dose equivalent in excess of one millisievert (100 millirems), a lens dose equivalent in excess of one and one-half millisieverts (150 millirems), or a shallow dose equivalent to the skin of the whole body or to the skin of any extremity in excess of five millisieverts (500 millirem). The assigned shallow dose equivalent must be the dose averaged over the contiguous ten square centimeters of skin receiving the highest exposure;
3. Women who have declared their pregnancy likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of one millisievert (100 millirem) (**NAC 459.333**);
4. Individuals entering a high or very high radiation area.

Regulation for Occupational Dose Limits

The licensee shall control the occupational dose to individual adults, except for a planned special exposures pursuant to **NAC 459.329**, to the following dose limits:

1. An annual limit, which is the more limiting of:
 - a. The total effective dose equivalent being equal to five-hundredths sievert (5 rems); or
 - b. The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to five-tenths sievert (50 rems).
2. The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities which are:
 - a. A lens dose equivalent of fifteen-hundredths sievert (15 rem); and
 - b. A shallow dose equivalent of five-tenths sievert (50 rem) to the skin.

Although personnel monitoring may not be required by regulation for a given situation, monitoring an employee's exposure may be prudent to prevent any future liability (from medical conditions, etc.), related to past radiation exposure.